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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/584,308	05/31/2000	Kenneth W. Fernald	CYGL-24,696	2221

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EXAMINER	
KING, JUSTIN	
ART UNIT	**PAPER NUMBER**
2111	13

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Please find below and/or attached an Office communication concerning this application or proceeding.

PRG

Office Action Summary	Application No. 09/584,308	Applicant(s) FERNALD ET AL.
	Examiner Justin I. King	Art Unit 2111

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 29 December 2003 .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-14 and 16-45 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-14 and 16-45 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

> 1. Determining the scope and contents of the prior art.
> 2. Ascertaining the differences between the prior art and the claims at issue.
> 3. Resolving the level of ordinary skill in the pertinent art.
> 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-14 and 16-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of the Hsieh et al. (U.S. Patent No. 5,559,971 and 5,428,750), Mu et al. (U.S. Patent No. 6,490,213), and Hilley et al. (U.S. Patent No. 5,603,061) or the combination of Hsieh, Hilley, and M. Morris Mano's Computer System Architecture.

Referring to claim 1: Hsieh discloses a triangular crossbar as a method of coupling plurality of signals to a plurality of destinations (971 Patent, column 1, lines 50-65). Hsieh's crossbar couples the signals to a routing circuit so that one of the signals can be routed to different destinations. Hsieh further discloses that some of the designations can be coupled to

more signal ports than others (750 Patent, figure 5). However, Hsieh does not explicitly assign or associate priority to each signal.

Mu discloses that it is known to use the crossbar switch to prioritize data transferring. Wu teaches one to route signals to respective destinations according to the priority assigned to said signals (column 9, lines 1-63). Mano, in his popular academic textbook, teaches one to use the crossbar to manage data transfer with appropriate priority setting (Page 457, 1^{st} paragraph).

None of the Hsieh, Mu, and Mano explicitly discloses the priority assigned to each port. Hilley discloses a prioritizing switch with preset priority value to its ports (column 3, 2^{nd} paragraph).

Hence, it would have been obvious to one having ordinary skill in the computer art to adapt Wu, Mano, and Hilley's teaching to Hsieh because Wu and Mano teach one to use the cross-bar in prioritizing data transferring and Hilley teaches one to support real time operations by assigning the priority to each port.

Referring to claim 2: Claim 2 is rejected over Hsieh in view of Mu or Mano as stated above; furthermore, Mu teaches one to assign priority to each one of crossbar's communication port. In combining with signal's priority, it is said Mu teaches one to assign a priority to each destination so that a highest priority signal is coupled by the routing circuit to a highest priority destination.

Referring to claim 3: Hsieh's 971 Patent's disclosure and Mu and Mano's teaching have been stated above, and Hsieh's 971 Patent discloses a write enable signals (column 1, lines 39-41). In addition, Hsieh's 750 Patent discloses a crossbar (figure 5, structure 74) with a row decoder (figure 5, structure 97). The row decoder functions as to enable or disable the crossbar's

row (column 6, lines 62-65); therefore, the decoder enables the routing circuit to control whether signals are to be routed there through. Although the 750 Patent's crossbar's input ports are located at different position than the 971's crossbar's input ports, it teaches one to disable or enable any triangular crossbar's row. Hence, it would have been obvious to one having ordinary skill in the art to adapt the teachings of Mu, Mano, and Hsieh's crossbar disabler onto Hsieh because the disabler provides a uniformed control on the data source and enables the crossbar to selectively choose the data source.

Referring to claim 4: Claim 3's argument applies; furthermore, it is well known to one that a lower priority request will be routed to the next available port in an access-switching arbitration scheme. For an example, a telephone switchbox handles incoming calls with FIFO priority fashion. Each telephone switchbox has several input ports, and the incoming phone call will be routed to the first available port. When the previous request releases the port, the current request can be routed to that freed port according to the assigned priority; and the port is equivalent to the claimed destination. In addition, in a multiple-bus arbitration scheme, it is also known to assign priority to each bus and signal; such that a signal can be routed to the next highest priority and available bus; and the bus is equivalent to the claimed destination. Hence, it is said it would have been obvious to shift lower priority signals to a higher priority destination, which is freed by a previous higher priority signal.

Referring to claim 5: Claims 3-4's arguments apply; furthermore, Mu discloses that the communication ports' priorities are arranged sequentially.

Referring to claim 6: Claim 1's argument applies; furthermore, Hsieh discloses the 32-port triangular crossbar to interconnect 4 bi-directional 8-bit buses. Hence, Hsieh's crossbar includes routing signals in a bi-directional manner.

Referring to claim 7: Claim 1's argument applies; furthermore, Mu teaches one to assign priority to each crossbar's communication port. Since each port has a priority setting, the path between the highest priority input port to the highest priority output port is said to be the priority route.

Referring to claim 8: Claims 1 and 7's arguments apply; furthermore, Mu's logic to carry out the claimed priority setting is the claimed digital logic, and it is both Hsieh and Mu's purpose to route digital signals through the circuit. Hence, it is said the prior arts use digital logic to carry out the routing tasks.

Referring to claim 9: Claim 1's argument applies; furthermore, Hsieh's triangular crossbar has routing cells arranged in row and column (column 1, lines 50-65), such that Hsieh's crossbar routing circuit routes a signal through a plurality of routing cells arranged in at least one row and in at least one column, from an input of the routing circuit to an output of the routing circuit.

Referring to claim 10: Claims 1 and 9's arguments apply; furthermore, Mu discloses that the communication ports' priorities are arranged sequentially. It is well known to one that a lower priority request will be routed to the next available port in an access-switching arbitration scheme. For an example, a telephone switchbox handles incoming calls with FIFO priority fashion. Each telephone switchbox has several input ports, and the incoming phone call will be routed to the first available port. When the previous request releases the port, the current request

can be routed to that freed port according to the assigned priority; and the port is equivalent to the claimed destination. In addition, in a multiple-bus arbitration scheme, it is also known to assign priority to each bus and signal; such that a signal can be routed to the next highest priority and available bus; and the bus is equivalent to the claimed destination. Hence, it is said it would have been obvious to shift lower priority signals to a higher priority destination, which is freed by a previous higher priority signal.

Referring to claim 11: Claims 1 and 9-10's arguments apply; furthermore, when a signal is transmitted to one particular port on one particular routing path, the routing cells on the path cannot convey other signal to the same port. Therefore, the routing circuit inherently generates a signal or a flag to prevent the cells on the path to convey any other signals. In addition, because the routing cells on the path are located to each other, these routing cells are neighbor routing cells. Hence, it is said that Hsieh's first routing cell transfers a signal coupled there to an output of the routing circuit, and further generates a control signal to disable neighbor routing cells.

Referring to claim 12: Hsieh's 971 Patent's disclosure and Mu and Mano's teaching have been stated above, and Hsieh's 971 Patent discloses a write enable signals (column 1, lines 39-41). In addition, Hsieh's 750 Patent discloses a crossbar (figure 5, structure 74) with a row decoder (figure 5, structure 97). The row decoder functions as to enable or disable the crossbar's row (column 6, lines 62-65); therefore, the decoder enables the routing circuit to control whether signals are to be routed there through. Although the 750 Patent's crossbar's input ports are located at different position than the 971's crossbar's input ports, it teaches one to disable or enable any triangular crossbar's row. Hence, it would have been obvious to one having ordinary skill in the art to adapt the teachings of Mu, Mano, and Hsieh's crossbar disabler onto Hsieh

because the disabler provides a uniformed control on the data source and enables the crossbar to selectively choose the data source.

Referring to claim 13: Claim 12's argument applies; furthermore, Hsieh discloses the 32-port triangular crossbar to interconnect 4 bi-directional 8-bit buses. Hence, Hsieh's crossbar includes routing signals in a bi-directional manner.

Referring to claim 14: Hsieh discloses a triangular crossbar as a method of coupling plurality of signals to a plurality of destinations (971 Patent, column 1, lines 50-65). Hsieh's crossbar couples the signals to a routing circuit so that one of the signals can be routed to different destinations. Hsieh further discloses that some of the designations can be coupled to more signal ports than others (750 Patent, figure 5). However, Hsieh does not explicitly assign or associate priority to each signal.

Mu discloses that it is known to use the crossbar switch to prioritize data transferring. Wu teaches one to route signals to respective destinations according to the priority assigned to said signals (column 9, lines 1-63). Mu discloses that the communication ports' priorities are arranged sequentially. Mano, in his popular academic textbook, teaches one to use the crossbar to manage data transfer with appropriate priority setting (Page 457, 1st paragraph).

When a signal is transmitted to one particular port on one particular routing path, the routing cells on the path cannot convey other signal to the same port. Therefore, the routing circuit inherently generates a signal or a flag to prevent the cells on the path to convey any other signals. In addition, because the routing cells on the path are located to each other, these routing cells are neighbor routing cells.

It is well known to one that a lower priority request will be routed to the next available port in an access-switching arbitration scheme. For an example, a telephone switchbox handles incoming calls with FIFO priority fashion. Each telephone switchbox has several input ports, and the incoming phone call will be routed to the first available port. When the previous request releases the port, the current request can be routed to that freed port according to the assigned priority; and the port is equivalent to the claimed destination. In addition, in a multiple-bus arbitration scheme, it is also known to assign priority to each bus and signal; such that a signal can be routed to the next highest priority and available bus; and the bus is equivalent to the claimed destination. Hence, it is said it would have been obvious to shift lower priority signals to a higher priority destination, which is freed by a previous higher priority signal.

None of the Hsieh, Mu, and Mano explicitly discloses the priority assigned to each port. Hilley discloses a prioritizing switch with preset priority value to its ports (column 3, 2nd paragraph).

Hence, it would have been obvious to one having ordinary skill in the computer art to adapt Wu, Mano, and Hilley's teaching to Hsieh because Wu and Mano teach one to use the cross-bar in prioritizing data transferring and Hilley teaches one to support real time operations by assigning the priority to each port.

Referring to claim 16: Claim 14's argument applies; furthermore, Hsieh's triangular crossbar has columns and rows, and the signals are input into the crossbar's routing cells in different rows, and extracting signals from output routing cells arranged in different columns (column 1, lines 50-65).

Referring to claim 17: Claim 17 is rejected as the claim 14's rejection stated above; furthermore, a higher priority signal will be more likely to obtain its requested input port and output port, and a lower priority signal will only obtain the currently available ports. In a event of competing for a port between a lower priority signal and a higher priority signal, the lower priority signal will be forced to wait or to move to the next available port; such that it is said that a lower priority signal can be routed to a greater number of outputs than a higher priority signal can be.

Referring to claims 18-19: Claims 18-19 are rejected with the same arguments as stated above for claims 4 and 5.

Referring to claims 20-21: Claims 18-19's arguments apply; claims 20-21 are rejected with the same arguments as stated above for claims 4-5. In addition, when a signal is transmitted to one particular port on one particular routing path, the routing cells on the path cannot convey other signal to the same port. Therefore, the routing circuit inherently generates a signal or a flag to prevent the cells on the path to convey any other signals. In addition, because the routing cells on the path are located to each other, these routing cells are neighbor routing cells. Hence, it is said that Hsieh's first routing cell transfers a signal coupled there to an output of the routing circuit, and further generates a control signal to disable neighbor routing cells.

Referring to claim 22: Claim 17's argument applies; furthermore, each of Hsieh's triangular crossbar's routing cells has a respective outputs coupled to a logic circuit (971's figure 2, structure 34) for providing a common column output (971's column 1, lines 53-54), and said common column output coupled to a pin driver (750's figures 1-3, and figure 5, structure 70).

Referring to claims 23-24: Claims 17 and 22's arguments apply; furthermore, claims 23-24 are rejected with the same argument as stated above for claims 10 and 11.

Referring to claim 25: Claim 17's argument applies; furthermore, Hsieh's 971 Patent discloses each routing cell of a row receives the same signal input (column 1, lines 53-54).

Referring to claim 26: Claims 17 and 25's arguments apply; furthermore, claim 26 is rejected with the same argument as stated above for claim 3. In addition, since Hsieh's 750 Patent's address decoder can disable each row from accepting signal, it is said each routing cell of a row receives a common select signal for selection whether the input signal to the row is to be couple to an output of the matrix. In addition, Hsieh's 971 Patent also discloses a write enable signals (column 1, lines 39-41).

Referring to claim 27: Claim 17's argument applies; furthermore, claim 27 is rejected with the same argument as stated above for claims 6, 19, and 22.

Referring to claim 28: Claim 17's argument applies; furthermore, claim 28 is rejected over Hsieh in view of Tower with the same argument as stated above for claims 1 and 3. Hsieh's 971 Patent discloses that each cell of a crosspoint array has a switch for routing the signal (column 1, lines 21-42), and Tower teaches a priority-setting mean for each communication port and signal. Although the prior arts only declare a priority-setting mean and do not explicitly declare each cell's switch includes the priority-setting mean, it has been held that the mere duplication of the essential working parts of a device involves only routine skill in the skill in the art (See St. Regis Paper Co. v. Bemis Co., 193 USPQ 8).

Referring to claim 29: Claim 29 is rejected with the same argument as stated above for claims 4 and 5.

Referring to claim 30: Claim 30 is rejected with the same argument as stated above for claims 4-5 and 10-11.

Referring to claim 31: Claim 31 is rejected with the same argument as stated above for claims 3 and 22. Since the disabler can block the intended input data by controlling the switches, it is said disabler is a circuit for carrying a signal to determine whether any input can be accepted and whether that input will be routed to an output. And either the input or output can be I/O pin.

Referring to claim 32: Claim 32 is rejected with the same argument as stated above for claim 17.

Referring to claim 33: Claim 33 is rejected with the same argument as stated above for claim 5.

Referring to claim 34: Claim 34 is rejected with the same argument as stated above for claim 1.

Referring to claim 35: Claim 35 is rejected with the same argument as stated above for claim 6.

Referring to claim 36: Claim 36 is rejected with the same argument as stated above for claim 17.

Referring to claim 37: Claim 37 is rejected with the same argument as stated above for claim 3.

Referring to claim 38: Claim 38 is rejected with the same argument as stated above for claim 22.

Referring to claim 39: Claim 39 is rejected as stated above; furthermore, the Hsieh's triangular crossbar is a matrix including a lack of routing cells at one or more intersections of the rows and columns (971's column 1, lines 48-50).

Referring to claim 40: Claim 40 is rejected with the same argument as stated above for claim 22; furthermore, Hsieh discloses that the receiving circuit also receives data signals not coupled through the matrix (750's figure 5, structures 70 and 76).

Referring to claims 41-42: Claim 36's argument applies; furthermore, Hsieh discloses a combination of microprocessor and plural chip terminal pins integrated with the routing circuit on a semiconductor chip (750's figure 1-5).

Referring to claims 43-44: Hsieh discloses a register controlling by a microprocessor for selecting which signal resources are to be routed through (750's figure 5, structure 89).

Referring to claim 45: Claim 36's argument applies; furthermore, Claim 45 is rejected with the same argument as stated above for claim 41; in addition, Hsieh discloses an active buffer for preventing signals from degrading (750's column 2,lines 40-45). In addition, it is know to one in the computer art to specify a crossbar's output as high-impedance.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin King whose telephone number is (703) 305-4571. The examiner can normally be reached on Monday through Friday from 9:00 A.M. to 5:00 P.M..

If attempts to reach the examiner by telephones are unsuccessfully, the examiner's supervisor, Peter Wong can be reached at (703) 305-3477.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose number is (703)-306-5631.

Justin King
Justin King
March 17, 2004

Gopal C. Ray
GOPAL C. RAY
PRIMARY EXAMINER
GROUP 2100